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Space, the Final Frontier for Negligence Suits—Why Commercial Space Operators Should Be Liable for Personal Injuries to Space Flight Participants

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SPACE, THE FINAL FRONTIER FOR NEGLIGENCE SUITS—WHY COMMERCIAL SPACE OPERATORS SHOULD BE LIABLE FOR PERSONAL INJURIES TO SPACE FLIGHT PARTICIPANTS

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INTRODUCTION

THE COMMERCIAL SPACE transportation industry is quickly approaching a critical milestone: the first paying customers traveling to space. After a decade of setbacks, the tide is finally turning for major commercial space transportation companies, and 2020 may finally be the breakout year for the private space transportation industry. In December 2018, Virgin Galactic made history by completing a successful crewed test of SpaceShipTwo, the first vehicle specifically built for commercial passenger travel to reach space.[1] Other companies are not far behind if they meet their target launch dates—a perpetual "big if" for the industry. SpaceX plans to complete a commercial crew demonstration flight of its Dragon vehicle by fall 2019.[2] Blue Origin plans to launch a crewed test flight of its New Shepard reusable rocket and capsule in 2019 after several successful tests returning the components safely to Earth.[3] Both Virgin Ga-

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[1] Sarah Scoles, *The WIRED Guide to Commercial Human Space Flight*, WIRED (Jan. 31, 2019), https://www.wired.com/story/wired-guide-commercial-space-flight/ [https://perma.cc/QUY8-7YRA].

[2] Eric Berger, *After Thursday Test Firing, SpaceX May Be a Month from Commercial Crew Launch*, ARS TECHNICA (Jan. 24, 2019), https://arstechnica.com/science/2019/01/after-thursday-test-firing-spacex-may-be-a-month-from-commercial-crew-launch/ [https://perma.cc/JJ9S-2UA9].

[3] Trevor Mogg, *Blue Origin's Latest Mission Shows How Space Tourism Might Look*, DIGITAL TRENDS (Jan. 23, 2019), http://www.digitaltrends.com/cool-tech/space-

lactic and Blue Origin claim to be "close to launching commercial services."[4] Richard Branson, founder and chairman of Virgin Galactic, plans to be the company's first civilian passenger—this year.[5] Over 700 people already hold tickets to travel into orbit with Virgin Galactic alone.[6] Additionally, SpaceX and Boeing hope to soon begin launching NASA astronauts into orbit under contracts to transport the U.S. government's astronauts to the International Space Station.[7] The Moon will also soon be within reach—SpaceX plans to send a group of artists and a Japanese billionaire to the dark side of the Moon and back in 2023.[8] Blue Origin also is racing to make it there by the same year.[9]

The future of private travel to space is bright, and ideally, access to space will not be limited to the extremely wealthy. Space travel should be accessible to researchers and scientists, teachers and students, and not just eccentric billionaires and celebrities.[10] Unfortunately, the current liability regime governing commercial space travel inadequately protects private citizens' safety and financial interests. Federal law requires passengers to waive any claim they may have for injury or death caused by a commercial space operator's negligence.[11] This policy places almost all of the risks of traveling to space on the passenger. A commercial operator only bears liability for injury to or death of private passengers for intentional, willful, or wanton conduct, as defined by state liability statutes.[12] Regulators and courts must develop a liability regime that not only protects private citizens

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tourism-latest-new-shepard-mission-shows-how-its-ride-might-look/ [https://perma.cc/52R2-N5UP].

[4] *Id.*

[5] Jonathan O'Callaghan, *2019 Is the Year that Space Tourism Finally Becomes a Reality. No, Really*, WIRED (Jan. 24, 2019), http://www.wired.co.uk/article/spacex-blue-origin-space-tourism [https://perma.cc/86MM-XMX4].

[6] *Id.*

[7] *Id.*

[8] Scoles, *supra* note 1.

[9] *Id.*

[10] A long list of celebrities have purchased tickets from Virgin Galactic, including Leonardo DiCaprio, Tom Hanks, Brad Pitt, Angelina Jolie, Russell Brand, Lady Gaga, Katy Perry, Justin Bieber, and Ashton Kutcher. Dennis Green, *Celebrities Aren't Bailing on Virgin Galactic After Crash*, BUS. INSIDER (Nov. 4, 2014), https://www.businessinsider.com/celebrities-arent-bailing-on-virgin-2014-11 [https://perma.cc/4QXT-TQJT].

[11] 51 U.S.C. § 50914(b) (Supp. I 2016).

[12] *See, e.g.*, Michael C. Mineiro, *Assessing the Risks: Tort Liability and Risk Management in the Event of a Commercial Human Space Flight Vehicle Accident*, 74 J. AIR L. & COM. 371, 381 (2009).

but also the industry from the type of widespread public backlash that doomed the zeppelin industry to the trash can of history.[13]

This Comment proposes that traditional state negligence principles should govern the liability regime between commercial space operators and private passengers. Congressionally-mandated cross-waivers of liability and other state and federal laws form a complex regulatory web that shifts risk from operators onto passengers. Private citizens should not bear the risk of injury or death when an accident is due to the operator's negligence. Part I lays out the historical development of the federal regulations that form the current liability regime for commercial space operators. Part II analyzes and critiques the principal federal liability statute and the U.S. Commercial Space Launch Competitiveness Act of 2015's provisions that affect the distribution of risk between operators and passengers, including cross-waivers of liability and informed consent provisions. Part III charts the state statutes that govern the content of liability waivers between operators and passengers, highlighting the gaps and contradictions between federal and state laws. Part IV proposes regulatory changes that would allow traditional state negligence doctrines to govern the duties and standards of care owed by private space operators to their passengers—a solution to the patchwork of state and federal laws that create legal uncertainty for a growing industry. Part V concludes with recommendations for short-term and long-term changes to federal law to transition that a fair and equitable liability regime for private passengers and commercial operators.

I. BACKGROUND

In his 1984 State of the Union address, President Reagan announced his support for the burgeoning U.S. commercial space transportation industry, emphasizing that private efforts would eventually eclipse the capabilities of NASA and other govern-

[13] The collapse of the zeppelin industry serves as a cautionary tale for the commercial space industry. The Hindenburg's infamous flight was supposed to usher in the era of the airship, but as the "first massive technological disaster caught on film . . . the scene became embedded in the public's consciousness," instead bringing the age to an abrupt end. *See* Jessie Szalay, *Hindenburg Crash: The End of Airship Travel*, LIVE SCI. (May 3, 2017), https://www.livescience.com/58959-hindenburg-crash.html [https://perma.cc/FVP7-R43M].

ments.[14] Congress soon passed the Commercial Space Launch Act of 1984, which governs the licensing, safety, and management of commercial launches and vests regulatory authority in the Department of Transportation (DOT).[15] Commercial capabilities quickly matured, making private space transportation a question of "when," not "if." In 2004, Congress amended the Act's statutory definitions to create a new legal classification for private citizens, the "space flight participant."[16] Current law defines "space flight participant" as "an individual, who is not crew or a government astronaut, carried within a launch vehicle or reentry vehicle."[17] Federal law subjects this new category of persons to different rules and regulations than those that protect government astronauts and the crews of commercial space transportation operators.[18] Most recently, Congress enacted the U.S. Commercial Space Launch Competitiveness Act of 2015 (CSLCA),[19] amending the liability-related provisions to insulate operators from legal responsibility for the bodily injury or death of a space flight participant (SFP) during a launch.[20]

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[14] JOHN THUNE, U.S. COMMERCIAL SPACE LAUNCH COMPETITIVENESS ACT, S. REP. NO. 114-88, at 1 (2015).

[15] Commercial Space Launch Act, Pub. L. No. 98-575, 98 Stat. 3055 (1984). Within the DOT, the Federal Aviation Administration (FAA) now oversees these regulations. THUNE, *supra* note 14, at 2.

[16] Commercial Space Launch Amendments Act of 2004, Pub. L. No. 108-492, § 2(b), 118 Stat. 3974, 3975 (codified as amended at 49 U.S.C. § 70102 (2004)) (current version at 51 U.S.C. § 50902(20) (Supp. I 2016)).

[17] 51 U.S.C. § 50902(20) (Supp. I 2016). "Crew" refers to an employee of an operator (and its contractors or subcontractors) who performs tasks relating to the launch, reentry, or operation of a vehicle. *Id.* § 50902(2) (2012). In 2015, Congress amended the Act to create the new category of "government astronaut" to further differentiate classes of persons participating in a commercial space flight. U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114-90, § 112(c), 129 Stat. 704, 711–12 (2015) (codified at 51 U.S.C. § 50902(4) (Supp. I 2016)). "Government astronaut" refers to an individual designated as such by NASA, operating in the course of his or her employment, and who is either an employee of the U.S. government or is an "international partner astronaut." 51 U.S.C. § 50902(4) (2012).

[18] The FAA defines "operator" as the "holder of a license or permit under 51 U.S.C. Subtitle V, chapter 509." 14 C.F.R. § 401.5 (2015). Chapter 509, titled "Commercial Space Launch Activities," refers to operators using the terms "licensee" and "transferee." *See* 51 U.S.C. §§ 50901–50923. This Comment will use the FAA's terminology of "operator."

[19] Pub. L. No. 114-90, 129 Stat. 704 (2015). This Comment will refer to the CSLCA of 2015 and all previous enactments still in force as the "Act." References cited herein may refer to the Act as the "Spurring Private Aerospace Competitiveness and Entrepreneurship Act of 2015" (SPACE Act of 2015), an alternate name for Title I of the CSLCA. *See id.* § 101.

[20] 51 U.S.C. § 50914(b) (Supp. I 2016).

II. FEDERAL REGULATIONS SHIELD COMMERCIAL OPERATORS FROM LIABILITY AT THE EXPENSE OF SPACE FLIGHT PARTICIPANTS

Three main provisions of the Act form the liability regime protecting commercial operators from the financial risks associated with private space transportation: (1) a three-tiered indemnification regime; (2) cross-waivers of liability between the operator and other entities; and (3) informed consent requirements for space flight participants.[21] Though this Comment focuses on how the second and third provisions shield operators from liability for SFP safety, the indemnification provisions warrant a brief discussion to illustrate the substantial financial support operators also receive from the government.

Congress created the commercial space operator indemnification regime in 1988 under the initial act as a form of risk sharing, similar to federal indemnification regimes for other high-risk, high-cost industries, such as nuclear power plants.[22] Under the first tier, operators must purchase insurance or demonstrate financial responsibility for all losses up to the "maximum probable loss," capped at $500 million per launch for third-party claims and $100 million for claims by the U.S. government.[23] Under the second tier, the U.S. government indemnifies the operator and assumes financial responsibility for paying third-party claims in excess of the operator's first-tier coverage up to $3 billion.[24] Under the third tier, liability reverts back to the operator in the event that claims exceed the amount covered by the first two tiers.[25] The operator's insurance policy must cover, "to the extent of their potential liability," government personnel, the operator's contractors, subcontractors, customers and their contractors, and SFPs.[26] The statutory requirement to cover SFPs

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[21] *Id.* §§ 50905(b)(5), 50914(a)–(b), 50915(a).

[22] Matthew Schaefer, *The Need for Federal Preemption and International Negotiations Regarding Liability Caps and Waivers of Liability in the U.S. Commercial Space Industry*, 33 BERKELEY J. INT'L L. 223, 235 (2015).

[23] 51 U.S.C. § 50914(a)(1)–(3) (2012). The maximum probable loss for a launch is calculated by the Secretary of Transportation in consultation with the Administrator of NASA and the Secretary of the Air Force. *Id.* § 50914(a)(2).

[24] *Id.* § 50915(a). The statute provides indemnification of $1.5 billion, amounting to approximately $3 billion as of October 2017 when adjusted for inflation. FED. AVIATION ADMIN., REPORT TO CONGRESS: FAA EVALUATION OF COMMERCIAL HUMAN SPACE FLIGHT SAFETY FRAMEWORKS AND KEY INDUSTRY INDICATORS, at 8–9 (2017) [hereinafter FAA EVALUATION].

[25] FAA EVALUATION, *supra* note 24, at 8–9.

[26] 51 U.S.C. § 50914(a)(4) (Supp. I 2016).

under the operator's first-tier insurance policy expires on September 30, 2025.[27]

A. Liability Cross-Waivers Shift the Burden of Nearly All Risks to the Space Flight Participant

Cross-waivers of liability are the second component of the Act's liability regime. All licenses require the operator to execute reciprocal waivers of claims with all "applicable parties" involved in activities under the license.[28] The waiver must state that each party "agrees to be responsible for personal injury to, death of, or property damage or loss sustained by" the party.[29] Applicable parties to the cross-waiver are the operator's contractors and customers, the customer's contractors, and SFPs (inclusion of SFPs in this provision also expires on September 30, 2025).[30] The Secretary of Transportation must issue cross-waivers of liability on behalf of the government with operators and with SFPs under similar terms.[31]

Though the Act's cross-waiver provision requires the SFP to execute reciprocal waivers with both the operator and the government, the rules promulgated by the Federal Aviation Administration (FAA) only detail the substantive requirements for the waiver between the SFP and the government.[32] Regardless of fault, the SFP must agree to: (1) waive and release all claims against the U.S. government for injury sustained during the licensed activity; (2) assume responsibility for injury resulting from licensed activity; (3) hold harmless the United States for injury; and (4) hold harmless and indemnify the United States "from and against liability, loss, or damage arising out of claims brought by anyone for property damage or bodily injury sustained by the space flight participant, resulting from licensed or permitted activities."[33] The reciprocal waiver provides that the United States agrees to, regardless of fault: (1) waive and release

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[27] *Id.* § 50914(a)(5).

[28] *Id.* § 50914(b)(1).

[29] *Id.*

[30] *Id.*

[31] *Id.* § 50914(b)(2). The government's cross-waivers only apply to the extent that losses exceed the insurance obtained by the operator under the first tier of the indemnification. *Id. See also* 14 C.F.R. § 460.49 (2007).

[32] *See* 14 C.F.R. § 440.17 (2016). The text of the rule specifies that an SFP must enter into a reciprocal waiver agreement with the government for "each licensed or permitted activity in which the United States or its contractors and subcontractors are involved." *Id.* § 440.17(d).

[33] *Id.* § 440.17(d)(1)(iv).

claims it may have against the SFP for property damage; (2) assume responsibility for damage it sustains from licensed activities to the extent that claims exceed the operator's first-tier insurance policy; and (3) extend the requirements of the waiver and release of claims against SFPs to the government's contractors and subcontractors.[34]

These provisions in the government's cross-waiver substantially reduce the liability insurance benefit SFPs gain from inclusion as a covered party under the indemnification regime. The operator's first-tier insurance policy only covers claims by the government and third parties for losses caused by the SFP,[35] but the cross-waiver releases any claim the government can bring against the SFP. In practice, the wavier would thus decreases the amount of coverage the operator must purchase because the government has released claims for losses against SPFs. The SFP loses the benefit of the operator's insurance coverage at the high price of assuming all risk of injury or loss the SFP may incur due to fault of the government. The indemnification regime, absent the SFP–government waiver, would shift some of the financial risks of SFP flight activity back to the operator to insure.

Cross-waivers also face a host of practical legal problems. First, FAA rules specify that federal law governs cross-waivers between the government and SFPs.[36] During the notice and comment period for Part 440, a DOT-appointed risk management attorney raised concern that states may strike down the cross-waivers as "contrary to public policy" if state law were to govern the federal government's waivers.[37] To resolve the risk that a state court might hold a waiver agreement void, the FAA's final rule states that "United States Federal law" governs.[38] However, this solu-

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[34] *Id.* § 440.17(d)(2). These three provisions are stipulations in the government's waiver that mirror the SFP waiver; however, the full waiver contains additional stipulations. *See id.*

[35] 51 U.S.C. § 50914(a)(1) (2012).

[36] 14 C.F.R. pt. 440 app. E § 7(c) (2012).

[37] Human Space Flight Requirements for Crew and Space Flight Participants, 71 Fed. Reg. 75,616, 75,628 (Dec. 15, 2006) (codified at 14 C.F.R. pt. 440 app. E). The final rule discusses supplemental materials documenting important differences across state laws compiled by Tracey Knutson. *Id.* In 2007, Knutson was appointed to the DOT's Commercial Space Transportation Advisory Committee and sat on the risk management committee. *See Tracey's Bio*, KNUTSON & ASSOCIATES, https://www.traceyknutson.com/traceys_bio.html [https://perma.cc/G6XL-XFZM] (last visited Oct. 2, 2019).

[38] 14 C.F.R. pt. 440 app. E § 7(c).

tion created a new problem—there is no general federal tort law. The House Report accompanying the CSLCA concedes there is a gap in substantive federal law in this area "absent a more defined statutory framework for the Federal courts to adjudicate such claims."[39] Representative Eddie Bernice Johnson flatly explained "there is no Federal civil tort law that would apply to commercial space launch providers."[40] The preamble to the FAA rule provides no solution to this problem.

Second, this lack of applicable body of tort law creates legal uncertainty over the waiver's limitations. The federal cross-waivers provide an exception to claims for bodily injury or property damage "resulting from willful misconduct of any of the parties to the reciprocal waiver."[41] Without any guiding federal law, parties cannot know how courts will interpret the "willful misconduct" exception. If the scope of the government's liability waiver to SFPs is unknown, SFPs may be unable to procure their own private insurance. Underwriters cannot reasonably develop policy coverage and terms without knowing the circumstances under which the government may be responsible for risks, rather than the SFP as policy holder.

These legal provisions governing the SFP–government cross-waiver do not apply to the cross-waivers between SFPs and operators. The Act mandates that the operator make a reciprocal waiver of claims with all "applicable parties," defined to include SFPs;[42] however, the FAA has not promulgated any rules governing the substantive or procedural requirements of the SFP–operator cross-waiver.[43] The Act's only relevant provision establishes venue for litigation, vesting exclusive jurisdiction in federal courts for claims by an SFP for death or bodily injury.[44] Unlike the choice-of-law provision mandating that federal law governs SFP–government cross-waivers, the SFP–operator cross-waivers would be litigated under state law in federal court. The CSLCA's House Report directly states that "it is not the intent" of Congress "to preempt state tort law" from governing liability

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[39] H.R. REP. NO. 114-119, at 28 (2015), *as reprinted in* 2015 U.S.C.C.A.N. 234, 255.

[40] *Id.* at 70 (minority view by Rep. Johnson).

[41] 14 C.F.R. § 440.17(f) (2016).

[42] 51 U.S.C. § 50914(b)(1) (Supp. I 2016).

[43] *See id.*; 14 C.F.R. §§ 460.45–460.49 (2007).

[44] 51 U.S.C. § 50914(g) (Supp. I 2016).

between SFPs and operators.[45] The SFP–operator waiver thus avoids the substantive gap in federal tort law that plagues the government's cross-waivers but only by running headlong into the original problem raised during notice and comment for the SFP–government waiver rule—different state law approaches create the risk that some waivers will be upheld while others are struck down. The lack of guidance from the FAA about this waiver all but ensures a patchwork of liability rules for both SFPs and operators.

B. Federal Informed Consent Requirements Complicate the Relationship Between State and Federal Law While Providing Little Protection for the Industry

The Act's third requirement mandates that SFPs provide written informed consent to the operator in order to participate in activities under the launch license. Congress considers space transportation "inherently risky," and the informed consent requirement reflects its desire that SFPs receive risk-related information prior to participating in a launch.[46] The Act states that an operator may only launch with an SFP if in writing: (1) the operator informs the SFP of the risks of space travel, including the safety record of the launch vehicle; (2) the operator informs the SFP that the federal government has not certified the launch vehicle as safe, prior to receiving compensation or agreeing to fly; and (3) the SFP provides consent to participate in the launch and agrees to any medical or training requirements prior to launch, if issued by the Secretary of Transportation.[47] The FAA promulgated a detailed list of information that an operator must disclose to SFPs to fulfill its informed consent obligations under its launch license.[48] During the notice and comment period, major space operators expressed concern that some requirements lacked clear definitions and standards, rais-

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[45] H.R. Rep. No. 114-119, at 28 (further stating "the intent of the Committee is to prohibit preemption and instruct the Courts to apply state substantive law to resolve claims").

[46] *Id.* at 16; *see also* 51 U.S.C. § 50901(12) (2012).

[47] 51 U.S.C. § 50905(b)(5)–(6) (Supp. I 2016).

[48] 14 C.F.R. § 460.45 (2007).

ing the likelihood of litigation over the scope of the informed consent provision.[49]

This legal uncertainty persists for the industry, despite Congress's intent that although the informed consent requirements do not confer any legal "protection for the launch providers," they also are not subject to any "statutory enforcement."[50] At a minimum, informed consent requirements may show Congress intended that SFPs assume some of the risk of space travel.[51] Assumption of risk can sometimes act as a "complete defense" to a plaintiff's claim, though courts may be unlikely to "absolve" the industry of liability if its warnings are not sufficiently clear.[52]

At the same time, an FAA-commissioned study has interpreted congressional intent in the Act as codifying a "duty to warn" for operators.[53] Not only might the warnings fail to add any protection from liability, they may create a separate legal duty owed by the operator to SFPs, similar to the duty owed by adventure sport operators to participants.[54] Several courts recognize a cause of action "claiming that an operator/provider breached the duty to obtain informed consent and/or that a participant has been deprived of informed consent."[55] Where statutes or regulations "govern the amount of information that must be given," compliance with the statute can create a rebuttable presumption that the operator gave proper informed consent.[56] However, proving regulatory compliance could itself be legally challenging, as the industry made very clear during the notice

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[49] *See* Human Space Flight Requirements for Crew and Space Flight Participants, 71 Fed. Reg. 75,616, 75,624–25 (Dec. 15, 2006) (codified at 14 C.F.R. § 460.45).

[50] H.R. REP. NO. 114-119, at 16.

[51] Tracey Knutson, *What Is "Informed Consent" for Space-Flight Participants in the Soon-to-Launch Space Tourism Industry?*, 33 J. SPACE L. 105, 119 (2007).

[52] *Id.* at 121.

[53] APT RESEARCH, INC., STUDY ON INFORMED CONSENT FOR SPACEFLIGHT PARTICIPANTS 10 (Sept. 26, 2008), https://www.faa.gov/about/office_org/headquarters_offices/ast/reports_studies/library/media/informed_consent_for_spaceflight_participants.doc [https://perma.cc/6LS5-ZUHU].

[54] *Id.* at 9.

[55] *Id.* at 10. Courts that recognize a cause of action for breach of the duty of informed consent include the D.C. Circuit and state courts in Colorado, Mississippi, New Jersey, and Oklahoma. *Id.* at 10 n.29.

[56] *Id.* at 11 (citing Texas and Louisiana courts holding that compliance with a statutorily defined warning creates a presumption of informed consent).

and comment period for the final FAA rule.[57] For example, the FAA rule requires that operators inform SFPs of the "safety record of *all* launch or reentry vehicles that have carried one or more persons on board, including U.S. government and private sector vehicles."[58] Comments from Blue Origin and several other companies requested that the FAA provide the industry all data on U.S. government launches "to ensure an accurate and impartial list, used equally by all operators."[59] The FAA responded only that it would "explor[e] available options" and consider "developing a database," but that operators were still fully responsible for providing the full safety record required by the rule.[60] The FAA thus promulgated the final informed consent rule with multiple interpretative concerns from the industry still outstanding. Operators do not know what level of disclosure will satisfy several of the requirements, since the FAA has not provided further guidance on several key comments on the rule, leaving courts the task of determining the scope of an operator's duty to provide informed consent.

Until the first accident happens and informed consent agreements are finally tested in court, it is unclear how much legal protection they provide the industry. These agreements will likely be litigated in state negligence suits brought by SFPs. Part III will discuss how these federal informed consent requirements could complicate these future suits against commercial operators.

III. STATE LIABILITY REGIMES—A PATCHWORK OF DOCTRINES UNABLE TO FULLY PROTECT SPACE FLIGHT PARTICIPANTS

State liability statutes fill the gap left by the lack of FAA rules and regulations governing the substantive and procedural provisions for cross-waivers between operators and SFPs. In support of the law, Congress found that "participation of State governments in encouraging and facilitating private sector involvement . . . is in the national interest and is of significant public benefit."[61] The Act contains an express clause addressing the rela-

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[57] *See* Human Space Flight Requirements for Crew and Space Flight Participants, 71 Fed. Reg. 75,616, 75,624–25 (Dec. 15, 2006) (codified at 14 C.F.R. § 460.45).

[58] *Id.* at 75,624 (emphasis added).

[59] *Id.* at 75,624–25.

[60] *Id.* at 75,625.

[61] 51 U.S.C. § 50901(a)(9) (2012).

tionship between federal and state law.[62] This section sets a federal floor for regulation of commercial operators but not a ceiling, acknowledging that nothing prevents state regulations "in addition to or more stringent than" any "law, regulation, standard, or order" set by the Act.[63]

A handful of states have passed statutes addressing the scope of liability between commercial operators and SFPs to fill the federal regulatory gap.[64] At least eight states directly address the liability owed to space flight participants: Arizona, California, Colorado, Florida, New Mexico, Oklahoma, Texas, and Virginia.[65] Some states, including Colorado, Florida, New Mexico, Texas, and Virginia, are home to existing or developing spaceports intended for commercial launches.[66] Other states created liability statutes to incentivize commercial space operators to locate their business in that state, bringing with them high-paying jobs and new economic opportunities.[67]

Significant differences exist across these state liability regimes. Every state provides some form of liability waiver for commercial space operators, with the major differences by state summarized in Table 1. With the exception of Arizona, each state statute sets out the specific scope of liability, including any limitations.[68] All states exempt intentional injuries from the waiver (except for Arizona), but from there, state liability models diverge.[69] This section will explore the various state provisions.

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[62] *Id.* § 50919(c).

[63] *Id.*

[64] Rachel A. Yates, *State Law Limitations on the Liability of Spaceflight Operators*, 9 SCITECH LAW. 14, 2 (2012).

[65] ARIZ. REV. STAT. ANN. § 12-558 (2016); CAL. CIV. CODE § 2212 (West Supp. 2019); COLO. REV. STAT. § 41-6-101 (2012); FLA. STAT. ANN. § 331.501 (West 2016); N.M. STAT. ANN. § 41-14-3 (LexisNexis 2013); OKLA. STAT. ANN. tit. 3, § 352 (West Supp. 2018); TEX. CIV. PRAC. & REM. CODE ANN. § 100A.002; VA. CODE ANN. § 8.01-227.9 (2015).

[66] Yates, *supra* note 64, at 1.

[67] Meredith Blasingame, Comment, *Nurturing the United States Commercial Space Industry in an International World: Conflicting State, Federal, and International Law*, 80 MISS. L.J. 741, 755–56 (2010).

[68] ARIZ. REV. STAT. ANN. § 12-558 (providing that a space flight entity *may* enter into an agreement to limit liability with an SFP, without specifying how much liability the agreement may waive).

[69] *See* CAL. CIV. CODE § 2212; COLO. REV. STAT. § 41-6-101; FLA. STAT. ANN. § 331.501; N.M. STAT. ANN. § 41-14-3; OKLA. STAT. ANN. tit. 3, § 352; TEX. CIV. PRAC. & REM. CODE ANN. § 100A.002; VA. CODE ANN. § 8.01-227.9; Yates, *supra* note 64, at 1.

Table 1

	Gross Negligence or Willful or Wanton Standard	Variation of Gross Negligence, Willful, Wanton, Reckless Standard	Dangerous Condition Standard	"Inherent Risk" Exception	Liability Waiver Conditioned on Informed Consent/ Warning	Assumption of Risk for SFP
Arizona[70]					X	
California[71]	X		X		X	
Colorado[72]	X		X		X	X
Florida[73]	X		X	X	X	X
New Mexico[74]		X	X	X		
Oklahoma[75]		X				
Texas[76]		X			X	
Virginia[77]		X				

A. The Scope of Protection for Space Flight Participants Against Operator Negligence Varies by State

The choice of language in a state's statute determines what duty an operator owes the SFP and defines the standard of care, departure from which constitutes breach. Most state statutes exempt any waiver of liability for a combination of gross negligence and willful or wanton disregard of the safety standard. California, Colorado, and Florida define gross negligence as a separate standard from that of a willful or wanton act.[78] The Texas, Virginia, and Oklahoma statutes contain a single standard, phrased as "gross negligence evidencing willful or wanton

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[70] *See* Ariz. Rev. Stat. Ann. § 12-558.

[71] *See* Cal. Civ. Code § 2212.

[72] *See* Colo. Rev. Stat. § 41-6-101.

[73] *See* Fla. Stat. Ann. § 331.501.

[74] *See* N.M. Stat. Ann. § 41-14-3.

[75] *See* Okla. Stat. Ann. tit. 3, § 352 (West Supp. 2018).

[76] *See* Tex. Civ. Prac. & Rem. Code Ann. § 100A.002.

[77] *See* Va. Code Ann. § 8.01-227.9 (2015).

[78] All three states limit the waiver if an operator "[c]ommits an act or omission that constitutes gross negligence or willful or wanton disregard for the safety" of the participant. Cal. Civ. Code § 2212(c)(1) (West Supp. 2019); Colo. Rev. Stat. § 41-6-10(1)(b)(I) (2012); Fla. Stat. Ann. § 331.501(2)(b)(1).

disregard" for participant safety.[79] New Mexico is the only state that does not use the term gross negligence, instead limiting the waiver in the case of "willful, wanton or reckless disregard for the safety of the participant."[80]

How courts interpret these liability standards determines the scope of the waiver. The Restatement (Third) of Torts explains that "willful" misconduct often requires showing intentional harm.[81] "Wanton" misconduct is defined in terms of recklessness.[82] Reckless conduct occurs when: (1) the person knows of the risk created by the conduct or "knows facts that make the risk obvious to another in the person's situation"; and (2) fails to take precautions where the burdens imposed to reduce the risk are "slight" relative to the magnitude of the risk.[83] The comments to the Restatement's definition of recklessness suggests it can include both a subjective standard (did the person actually know of the risk) and an objective standard (would a similarly situated person would find the risk obvious).[84]

The comments to the Restatement further suggest that common usage of these terms is not always precise; however, for "gross negligence" to have any meaning distinct from "willful or wanton" misconduct, it requires a definition that is less stringent than recklessness but more stringent than regular negligence.[85] Thus, the scope a waiver with a limitation for gross negligence *or* willful or wanton disregard for safety should allow an SFP to bring a claim against an operator without needing proof of intent to harm. Still, in some states where courts interpret the recklessness standard "as requiring the actor's actual knowledge of the danger," the objective requirement, an SFP faces a high burden.[86] Recognizing this harsh position for plaintiffs, the Restatement suggests that "the obviousness of the danger can sup-

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[79] OKLA. STAT. ANN. tit. 3, § 352(B)(1); TEX. CIV. PRAC. & REM. CODE ANN. § 100A.002(b)(1); VA. CODE ANN. § 8.01-227.9(B)(1).

[80] N.M. STAT. ANN. § 41-14-3(B)(1) (LexisNexis 2013).

[81] RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL AND EMOTIONAL HARM § 2 cmt. a (AM. LAW INST. 2010).

[82] *Id.*

[83] *Id.* § 2.

[84] *Id.* § 2 cmt. c.

[85] *Id.* § 2 cmt. a. The term gross negligence "simply means negligence that is especially bad," which must refer to a standard weaker than recklessness, otherwise "gross negligence" would be redundant with "willful or wanton" conduct. *Id.*

[86] *Id.* § 2 cmt. c.

port an inference of the person's knowledge" when direct proof may be unavailable.[87]

Since no private citizen has yet traveled to space with a commercial operator, courts will be working from a blank slate when eventually faced with adjudicating personal injury claims brought by SFPs under these liability provisions.

B. Whether the "Dangerous Condition" Exception Provides Extra Protection for Space Flight Participants Depends on How Courts Read the Provisions in Light of Informed Consent and Assumption of Risk Rules

Some states include an additional duty for operators based on the presence of dangerous conditions. California, Colorado, Florida, and New Mexico limit waiver of liability when the operator knows or should know of a dangerous condition on the land or in the facilities or equipment used during space flight activities.[88] This dangerous condition exception expands the scope of liability an operator owes to an SFP beyond that of gross negligence or willful or wanton conduct. As defined by the Restatement (Second) of Torts, a defendant is liable for harm caused by dangerous conditions when it: (1) "knows or by the exercise of reasonable care would discover the condition, and should realize that it involves an unreasonable risk of harm"; (2) "should expect [the person] will not discover or realize the danger, or will fail to protect themselves"; and (3) "fails to exercise reasonable care to protect" the person from danger.[89] The dangerous condition exception thus establishes a distinct duty owed by the operator to SFPs to exercise reasonable care to discover dangerous conditions on land (including prior to launch and upon reentry and landing), in any facility where activities under the launch license take place (including any training facility, launch facility, and the space vehicle itself), and in the equipment used

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[87] *Id.*

[88] Cal. Civ. Code § 2212(c)(3) (West Supp. 2019); Colo. Rev. Stat. § 41-6-101(1)(b)(II) (2012); Fla. Stat. Ann. § 331.501(2)(b)(2) (West 2016); N.M. Stat. Ann. § 41-14-3(B)(2) (LexisNexis 2013). The statutes are nearly identically worded. For example, California's dangerous condition provision applies when the operator "[h]as actual knowledge or reasonably should have known of a dangerous condition on the land or in the facilities or equipment used in space flight activities and the dangerous condition proximately causes injury, damage, or death to the participant." Cal. Civ. Code § 2212(c)(3).

[89] Restatement (Second) of Torts § 343 (Am. Law Inst. 1965).

during the time covered by the license (including maintenance and inspection of equipment manufactured by a third party).

The dangerous condition exception's second element asks whether the operator "should expect that [SFPs] will not discover or realize the danger, or will fail to protect themselves against it."[90] How courts interpret the relationship between the dangerous condition exception and the informed consent requirement will likely determine whether an SFP can ever satisfy the burden of proof for this second element. An operator seeking to avoid liability could make a strong case that the specific informed consent provisions required by the FAA make it impossible for the operator to violate the second element. The FAA's rule mandates that the informed consent disclosure includes information "[t]hat there are hazards that are not known" inherent to space flight.[91] If an SFP acknowledges that unknown risks exist, it could relieve the operator of liability, since the SFP may have assumed the risk that dangerous conditions are present and acknowledged an appreciation of those dangers by giving informed consent.[92] If a court strictly followed the Restatement definition, an SFP might prevail on an interpretation that the second element's two clauses are disjunctive.[93] Read literally, an operator could still be liable if the SFP discovers the risk and realizes the danger yet fails to protect themselves against it.

For launches covered by the California, Colorado, Florida, and New Mexico statutes,[94] courts will have to resolve the tension between the state legislatures' intent that operators owe a

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[90] *Id.* § 343(b).

[91] 14 C.F.R. § 460.45(a)(2) (2007).

[92] *See* APT RESEARCH, INC., *supra* note 53, at 3 (stating that the FAA informed consent rule represents a "cognizance test" or an "affirmation that the space flight participant understands what he or she is getting into before embarking on a mission") (citations omitted).

[93] The Restatement crucially says "will not discover . . . *or* will fail to protect themselves." RESTATEMENT (SECOND) OF TORTS § 343(b).

[94] Interpreting how much risk an SFP assumes by complying with federal informed consent requirements is further complicated by the fact that two states with dangerous condition exceptions also contain express assumption of risk provisions. The Florida liability statute requires an SFP to sign a warning that includes "assuming the risk of participating in this spaceflight activity" (though the rest of the warning may limit this to "inherent risks"). FLA. STAT. ANN. § 331.501(2)–(3) (West 2016). The Colorado statute contains similar language, requiring a signed agreement and warning that an SFP "assume[s] the inherent risk of participating in this spaceflight activity." COLO. REV. STAT. § 41-6-101(3) (2012).

duty of reasonable care under the dangerous condition exception on one hand and the federal government's intent that SFPs assume some risk through waivers and informed consent agreements on the other hand. A court could resolve this conflict by declaring that a state-level dangerous condition exception is preempted by the Act's language that a state "may not adopt or have in effect a law, regulation, standard, or order inconsistent with" the federal informed consent requirement.[95] Or a court could interpret a state's dangerous condition exception as consistent with the second part of the preemption provision, which provides that states may adopt a law that is "in addition to or more stringent than a requirement of, or regulation prescribed under" the Act.[96] Because it is unclear what exactly the preemption clause means by "more stringent" than federal law, courts conducting their preemption analysis could reach opposite findings on the validity of state dangerous condition exceptions.[97] One court could interpret the dangerous condition exception as a "more stringent" safety protection for SFPs (thus allowed by the preemption clause), and another court could decide the exception is "inconsistent" with SFP–operator liability waivers (thus prohibited by the preemption clause).

Potential conflicts between the Act and state laws pose thorny questions for the courts' preemption analyses, and there is no "rigid formula or rule which can be used as a universal pattern" to resolve whether Congress intended to preempt other state waiver provisions with the Act's informed consent requirements.[98] When the text of a federal statute does not provide a "clear or explicit" answer to resolve the conflict, courts generally start with a "presumption in favor of local law in cases dealing with areas traditionally regulated by states."[99] Predicting how courts might ultimately resolve these preemption questions is beyond the scope of this Comment,[100] but it is important to acknowledge the inconsistencies and conflicts between state and federal regulations when considering future paths for reform. Ultimately, increasing the clarity and consistency of the liability

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[95] *See* 51 U.S.C. § 50919(c)(1) (2012).

[96] *Id.* § 50919(c)(2).

[97] *See* Blasingame, *supra* note 67, at 777–78.

[98] *Id.* at 771.

[99] *Id.* at 772.

[100] For an in-depth discussion of possible preemption analysis outcomes, see Blasingame, *supra* note 67, at 768–87.

regime will likely require substantive changes to both state and federal law.

C. "Inherent Risk" Provisions May Provide Commercial Operators Complete Immunity in Some States

One final state-level provision defining the scope of liability is the exception that operators are not liable for injury due to "inherent risks," contained in the Florida and New Mexico statutes.[101] Florida's statute provides that an SFP cannot bring an action for injury or death "resulting from the inherent risks of spaceflight activities," subject to limitation by an operator's willful or wanton disregard for safety, the dangerous condition exception, or an intentional injury.[102] New Mexico's statute is nearly identically worded.[103] These inherent risk provisions do not, and cannot, clearly establish when they will prevent SFPs from bringing a claim because the inherent risks of space travel are unknown.[104] If a claim is filed against an operator in a scenario where a yet-to-be-identified phenomena causes a fatal accident, how are the parties and courts to determine whether an unknown risk is an "inherent" risk?

Both statutes raise complex causation and burden of persuasion questions by linking the inherent risk provision (which limits the operator's liability) with a gross negligence, dangerous condition, and/or intentional tort exception (which increases the operator's liability). If an SFP makes a prima facie case for gross negligence, is the defense of an inherent risk an affirmative defense for the operator, or must it still negate each claim of negligence by the SFP? Or does the statute's assumption that an accident is the result of an inherent risk (unless proven negligent) constitute the existence of a "no duty" case, such that the court would decide as a matter of law that the defendant is not liable?[105]

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[101] Fla. Stat. Ann. § 331.501(2)(a) (West 2016); N.M. Stat. Ann. § 41-14-3(A) (LexisNexis 2013).

[102] Fla. Stat. Ann. § 331.501(2).

[103] N.M. Stat. Ann. § 41-14-3(A)–(B).

[104] Knutson, *supra* note 51, at 117; George C. Nield et al., *Informed Consent in Commercial Space Transportation Safety*, IAC-13-D5.1.4, 64 Int'l Astronautical Cong., at 3, 5 (2013), http://www.faa.gov/about/office_org/headquarters_offices/ast/programs/international_affairs/media/Informed_Consent_paper_IAC_Sept_2013_FAAfinal.pdf [https://perma.cc/XH7A-VDPK].

[105] Restatement (Third) of Torts: Liab. for Physical and Emotional Harm § 8 (Am. Law Inst. 2010).

New Mexico's statute further complicates this inquiry by barring claims when an injury or death results "*exclusively* from any of the inherent risks" of space travel.[106] The exclusivity requirement makes litigating inherent risk even more complex, as a court must decide: whether an exclusive inherent risk refers to a single causal event requiring proof of but-for causation; whether more than one proximate cause could still exist; whether proof of causation could be established by inference; and whether a preponderance of the evidence standard satisfies the burden of proof necessary to demonstrate an *exclusive* cause of an accident.[107]

How courts will inevitably interpret state statutes in light of federally-mandated liability waivers is unknown, given no cases have yet litigated these provisions. Passengers that turn to state courts in the case of an accident face an uncertain legal landscape that complicates application of traditional state negligence doctrines.

IV. OPTIONS FOR REFORM—A FORWARD-LOOKING LIABILITY REGIME THAT REGULATES THE COMMERCIAL SPACE INDUSTRY AS A FORM OF TRANSPORTATION

Commercial space transportation operators will soon bring private citizens to space, potentially as early as the next few years. Congress and the states should act to resolve the host of problems identified in Parts II and III that plague the liability regime, ideally by the time commercial operators begin regular flights with private passengers. Federally-mandated cross-waivers of liability and informed consent provisions create a complicated patchwork of laws insufficient to protect SFP safety when overlaid with state negligence-based liability statutes.

This Comment proposes a simpler liability regime—states should regulate commercial space transportation under the same negligence doctrines that apply to other forms of public transportation. In most states, this will impose a duty of reasonable care, defined by the standard of what a reasonably prudent operator would do under the same or similar circumstances. In

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[106] N.M. STAT. ANN. § 41-14-3(A) (emphasis added).

[107] The Restatement (Third) of Torts explains that the "civil burden of proof merely requires a preponderance of the evidence, and the existence of other, plausible causal sets that cannot be ruled out does not, by itself, preclude the plaintiff from satisfying the burden of proof on causation." RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL AND EMOTIONAL HARM § 28 cmt. b.

a few states, this may resemble common carrier duties, which hold operators to the highest standard of care. Either negligence standard would be a marked improvement over the status quo, where the standard of care owed by operators to SFPs is unnecessarily lax, legally unclear, or both. Eliminating the federally mandated SFP–operator cross-waiver requirement would remove the legal shield that prevents operators from bearing the financial burden for their own negligent acts. Traditional state negligence doctrines should fill in and allow SFPs to bring suits against operators who fail to meet the appropriate standard of care when accidents occur. The Act's cross-waiver requirements currently expire in 2025,[108] though ideally, Congress should repeal these requirements before the first commercial space flights carry private citizens. Alternatively, if amending the current Act is politically infeasible, Congress should not renew these provisions when authorizing the Act for the post-2025 period.

A. Expanding Tort Protections—The Duty of Operators and a Case for Imposing Common Carrier or "Reasonably Prudent Operator" Liability

Tort law serves important social goals by compensating injured victims and incentivizing behavioral changes in private actors to avoid negligent acts and to purchase insurance to hedge against the potential financial costs of liability.[109] Negligence suits are an important vehicle for achieving these ends.[110] The restorative function of tort law rests on the principle that a negligent party should pay the costs for harm it inflicts on other parties.[111] This restorative function is compensatory, and it follows that a party should carry liability insurance sufficient to satisfy the goal of making the injured party whole.[112] Allowing negligence suits against operators protects the interests of SFPs by ensuring operators carry sufficient insurance to pay out claims in case of an accident to compensate for their loses. This legal relationship allocates the responsibilities for and costs of an ac-

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[108] 51 U.S.C. § 50914(b)(1)(C) (Supp. I 2016).

[109] Gary T. Schwartz, *The Ethics and the Economics of Tort Liability Insurance*, 75 Cornell L. Rev. 313, 337, 360 (1990).

[110] *Id.* at 324–25, 328.

[111] Jane Stapleton, *Tort, Insurance and Ideology*, 58 Mod. L. Rev. 820, 820 (1995).

[112] Schwartz, *supra* note 109, at 328.

cident proportionate to the actor's contribution to possible risks.

Defining the scope of liability still requires establishing the bounds of the legal relationship between two parties by clearly defining the applicable duties and standards of care. Duty generally refers to the "fact that [an] actor is required to conduct himself in a particular manner" towards another party.[113] Tort law imposes liability on an actor when it owes a duty to another, it breaches the standard of care imposed by that duty, and that breach causes injury to the party to whom the duty is owed.[114] Establishing that an actor owes any duty to another party is the predicate requirement for any claim for negligence.[115] When an actor owes a duty, the next question is what standard of care flows from that duty.[116] This section will discuss what duty commercial space operators owe to SFPs and the appropriate standard of care the law should require to fulfill that duty.

The duty owed by an operator to an SFP depends on the nature of the relationship between the two parties, which determines the type of conduct the operator must engage in or refrain from.[117] No single conception of this relationship exists, as a result of diverging—and sometimes contradictory—characterizations of the emerging commercial space industry by U.S. regulators. One view sees private space travel as merely a new form of adventure tourism.[118] The other view treats the industry as a new frontier for transportation.[119] Members of the Senate and House Committees responsible for these regulations have long espoused these conflicting views of the industry they are tasked with regulating.[120]

Legal regimes that regulate the industry solely as tourism at the exclusion of transportation inherently fail to account for the full range of future commercial space operations, since there is

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[113] RESTATEMENT (SECOND) OF TORTS § 4 (AM. LAW INST. 1965).

[114] Keith N. Hylton, *Duty in Tort Law: An Economic Approach*, 75 FORDHAM L. REV. 1501, 1501 (2006).

[115] *Id.*

[116] *See id.*

[117] Whether a particular relationship "supports a duty of care is a question of law for the court." RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL AND EMOTIONAL HARM § 40 cmt. e (AM. LAW INST. 2010).

[118] Knutson, *supra* note 51, at 109.

[119] *See, e.g.*, Mineiro, *supra* note 12, at 373.

[120] Timothy R. Hughes & Esta Rosenberg, *Space Travel Law (and Politics): The Evolution of the Commercial Space Launch Amendments Act of 2004*, 31 J. SPACE L. 1, 41, 46–47 (2005).

no single purpose or business model driving development of the industry.[121] For example, commercial operators are developing different technologies for different applications, some of which, like point-to-point travel, are indistinguishable from current transportation in terms of the relationship between the operator and the passenger.[122] The liability regime should recognize the transportation functions of commercial space travel and Congress should define the relationship between operators and SFPs taking this into account.

A duty for operators to treat SFPs as passengers appropriately recognizes the special relationship between the parties. Establishing that commercial space operators owe a special duty to SFPs as passengers then gives rise to the standard of care owed, departure from which constitutes negligence. Two possible conceptions for the duty are that of a reasonable operator or of a common carrier, and the standard of care owed would differ depending on which duty relationship state legislatures or courts adopt.[123] Either conception would raise the standard of care owed by operators to SFPs over current law by allowing passengers to bring suits against negligent operators.

1. Operators as Common Carriers and the Highest Standard of Care

Commercial space operators fit within traditional definitions that courts apply when deciding whether a party owes the duties of a common carrier to its passengers. Early American common law classified common carriers as any private company that offered transportation services to the general public.[124] An early working definition focused on the nature of the party offering the service, defining a common carrier as "one who by virtue of his calling undertakes, for hire, to transport persons . . . from one place to another, for all who choose to employ him."[125] As technological advances gave rise to new forms of transportation, courts extended the duties of common carriers to each new mode, from stagecoaches, to railroads, and eventually to air-

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[121] *See* Walter Peeters, *From Suborbital Space Tourism to Commercial Personal Spaceflight*, 66 ACTA ASTRONAUTICA 1625, 1631 (2010).

[122] *Id.* at 1630–31 (describing point-to-point trips where passengers will fly "prime trajector[ies]" like New York–Tokyo in ninety minutes).

[123] *See* Knutson, *supra* note 51, at 113.

[124] Reuben Leslie Maynard, The Liability of the Common Carrier as Insurer, *in* HISTORICAL THESES AND DISSERTATIONS COLLECTION 5 (Cornell U. L. Sch., Paper 188, 1891).

[125] *Id.*

planes.[126] Courts reasoned that the public needs higher levels of protection when the methods of transportation are undeveloped, justifying a higher duty and standard of care imposed on the carrier.[127] To determine if a pilot should be held as a common carrier, courts asked if the "product and service are available to the public generally" and if the carrier "hold[s] himself ready to serve the public."[128] This "holding out" test depends on a number of factors, including having an established place of business, a public offering of services, regular charges and fees, and undertaking the service as a business rather than as a "casual or occasional undertaking."[129] When commercial space operators begin regular service to customers, they will likely meet these factors.

Courts hold common carriers to a "higher degree of care . . . consistent with the mode of conveyance used and the practical operation" of the business.[130] For commercial space operators, this standard of care likely represents the care they would exercise anyway. These companies have every incentive to exercise the highest care possible, given the enormous financial investments already expended developing their operations and space vehicles. Public opinion could sharply turn against the entire industry in the case of an accident if an operator was found to have acted recklessly or negligently.[131] Because passenger safety is absolutely critical to positive outcomes from early endeavors, operators do not have room for error. This incentivizes companies to work together to ensure that high standards become industry custom.[132] A commercial space company must exercise a high level of care to survive, and the law should reflect that to support the trajectory the industry must inevitably take to flourish.

California is one possible state that could apply common carrier duties to commercial space operators. Notably, California's commercial space liability statute is located within its Civil Code chapter titled "Common Carriers."[133] State courts have held op-

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[126] Louis Shanfeld, *Airplanes as Common Carriers*, 18 ST. LOUIS L. REV. 148, 148–49 (1933).

[127] *Id.*

[128] *Id.* at 149.

[129] Jackson v. Stancil, 116 S.E.2d 817, 824–25 (N.C. 1960).

[130] Mineiro, *supra* note 12, at 377.

[131] *See* Knutson, *supra* note 51, at 119 n.55 (stating the "industry wide result" will be "an implosion of sorts").

[132] *Id.*

[133] *See* CAL. CIV. CODE div. 3, pt. 4, tit. 7, ch. 5, art. 5 Note (West Supp. 2019).

erators liable as common carriers even when dealing with a new industry or recreational transportation.[134] The California Supreme Court, in an early case holding a pilot liable as a common carrier, noted that "it is not a reason for applying different rules of liability to say that [the craft] and the industry [are] new."[135] The court also held that a recreational purpose does not defeat a finding of common carrier obligations because there is no reason a passenger's motive should "make any difference as to the degree of responsibility" put on the carrier.[136]

2. "Reasonably Prudent Operators" and the Standard of Care

Another way to conceptualize the duty commercial space operators could owe their passengers draws from the Restatement (Third) of Torts approach to special relationships, which imposes a duty of reasonable care "with regard to risks that arise within the scope of the relationship."[137] The Restatement lists a carrier's relationship with its passengers as the first example of a special relationship that gives rise to a duty of reasonable care.[138]

A "reasonably prudent" operator acts negligently when it does not "exercise reasonable care under all the circumstances."[139] This standard of care takes into account "the foreseeable likelihood that the [operator's] conduct will result in harm, the foreseeable severity of any harm that may ensue, and the burden of precautions to eliminate or reduce the risk of harm."[140] Many courts have long adopted this approach, as described by Judge Learned Hand in *United States v. Carroll Towing Co.*, which balances the probability and severity of the harm against the burden required to avoid it.[141] Expressed algebraically, an operator is liable for negligence when $B < P \times L$, where B is the burden of taking "adequate precautions," P is the probability of an accident occurring, and L is the magnitude of the harm.[142] An operator would thus breach the standard of reasonable care where

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[134] Smith v. O'Donnell, 12 P.2d 933, 934 (Cal. 1932).

[135] *Id.*

[136] *Id.* at 935.

[137] RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL AND EMOTIONAL HARM § 40(a) (AM. LAW INST. 2010).

[138] *Id.* § 40(b)(1).

[139] *See id.* § 3.

[140] *See id.*

[141] United States v. Carroll Towing Co., 159 F.2d 169, 173 (2d Cir. 1947).

[142] *Id.*

the burden of taking precautions is less than the extent of harm. In the case of commercial space transportation, data exist to help operators, regulators, and courts determine the severity of risks SFPs might face (L) and the probability of space accidents and injuries (P).[143]

B. A Higher Standard of Care Would Better Protect the Interests of Space Flight Participants and Commercial Operators

A liability regime based on either common carrier or reasonably prudent operator standards of care will provide more legal clarity to both operators and SFPs. SFPs or their heirs should be able to bring negligence suits in the case of serious injury or death to compensate them for their losses. Operators should be subjected to a set of liability rules that courts are already familiar applying. The current patchwork of federally-mandated cross-waivers and informed consent requirements layered on top of differing state statutes serves neither the goal of protecting SFPs' interests nor providing certainty to operators for when they might be held liable in the case of an accident.

Traditional negligence approaches better ensure that SFPs are compensated in case of an accident and that operators carry enough insurance to cover losses should they fail to exercise the appropriate standard of care. First, operators are better situated to insure against the risk of SFP injury than each potential private passenger. One assumption behind the current regime is that SFPs are likely to be extremely wealthy and could thus afford the cost of purchasing their own private insurance.[144] However, SFPs may not be able to purchase insurance because it is unavailable on the market or because individual policies may be too expensive.[145] Early SFPs may not be able to purchase insurance at all due to lack of market offerings, since the pool of insureds may not be "large enough to be profitable for insurers underwriting policies."[146] Even if a market develops for private space travel insurance, it could still be unaffordable for SFPs to

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[143] Christopher D. Johnson, *The Texas Space Flight Liability Act and Efficient Regulation for the Private Commercial Space Flight Era*, 92 Acta Astronautica 226, 230–33 (2013).

[144] *See* Matthew Schaefer, *The Intersection of Insurance Markets and Liability Regimes Regarding Third-Parties and Space Flight Participants in Commercial Space Activities*, 57 Proc. Int'l Inst. Space L. 407, 419 (2014).

[145] *Id.* at 411, 419.

[146] *Id.* at 411.

pay to insure all of the possible risks they currently bear legal responsibility for. At least one company has proposed a private policy for SFPs that covers death and serious injury up to $5 million per passenger.[147] This policy could cost at least $100,000, or approximately 50% of the deposit price to travel with Virgin Galactic.[148] There will likely be passengers such as researchers, teachers, or students that cannot afford to purchase an individual policy.[149] Imposing the full cost of insurance on SFPs could price out potential passengers who are not billionaires. Operators may also be better situated to acquire liability coverage by working directly with insurance companies than private individuals. Not only could operators foster business goodwill with SFPs, they would be able to purchase coverage for a larger number of insureds, providing underwriters with additional risk data and a large enough pool to better spread their risks.[150]

Second, opponents of greater operator liability overstate the risk that shifting more of the liability insurance costs to operators will financially harm the emerging industry.[151] Members of Congress who advance this argument cite no studies or data to support this claim.[152] Given the uncertainty over when operators may be liable for injury or death to an SFP, financially conservative and risk adverse companies may choose to take on the extra financial cost by electing to include coverage for these risks to SFPs anyway.[153]

Third, legal uncertainty itself poses potentially the greatest risk to the industry. Managing early liability for passengers is critical because industry growth "depends on attracting new customers beyond early adopters."[154] The "media-sensitive" space industry may reasonably calculate that legal fights after a major accident could turn public opinion and harm the industry far more than paying the actual costs for additional insurance cov-

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147 *Id.* at 418. Ironshore International's Pembroke Managing Agency Limited (a syndicate of Lloyd's) proposed the policy. *Id.*

148 *Id.* at 419; O'Callaghan, *supra* note 5.

149 161 CONG. REC. H3511, 3526 (daily ed. May 21, 2015) (statement of Rep. Rohrabacher).

150 *Cf.* Schaefer, *The Intersection of Insurance Markets*, *supra* note 143, at 410–11.

151 *See, e.g.*, *id.* at 419, 421.

152 *See, e.g.*, 161 CONG. REC. H3511, 3531 (daily ed. May 21, 2015) (statement of Rep. Smith).

153 Denis Bensoussan, *Space Tourism Risks: A Space Insurance Perspective*, 66 ACTA ASTRONAUTICA 1633, 1636 (2010).

154 FAA EVALUATION, *supra* note 24, at 15.

erage.[155] Industry players and academics alike agree that a space accident will be inevitable at some point.[156] If an operator miscalculates the amount of liability it owes other parties, it could end up purchasing an insufficient amount of insurance to cover potential losses.[157] A surprise adverse ruling in state court, combined with likely having to ground operations after an accident, could cripple a company as the industry begins full service.[158]

C. Traditional State Tort Liability Provides a Better Option for Reform than Proposals for Complete Federal Preemption of State Law

The current regime governing operator liability for SFPs is unnecessarily complicated. Its rules and regulations are incomplete, unclear, untested, and sometimes contradictory. Applying traditional state negligence doctrines would better protect SFP safety by setting clear duties and standards of care based on familiar common law approaches to the transportation industry. Courts will inevitably be presented with a personal injury suit from a private space accident, and the common carrier and Restatement (Third) of Torts special relationship approaches provide two possible doctrines for courts to apply to a currently blank slate of law.

These negligence doctrines, while not perfect, are preferable to resolving these problems through federal preemption of state tort law. Several academics propose that the federal government should preempt state tort claims altogether, "precluding both negligence and gross negligence claims."[159] This regime fails to appropriately spread the risks of a serious accident. It would leave SFPs to bear all of the risks, even when losses are due to an operator's reckless or negligent conduct. The rationale set forth for shifting the industry's risk onto passengers is unpersuasive. The claim that "the nascent industry" needs to avoid "crushing liability . . . to place the industry on a level playing field with

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[155] *Cf.* Bensoussan, *supra* note 152, at 1636.

[156] *See, e.g.*, *id.*; Knutson, *supra* note 51, at 112 n.29 (stating that the loss rate will be "at least 1 in 200 and probably more like 1 in 50").

[157] *Cf.* Bensoussan, *supra* note 152, at 1635–36.

[158] *See id.*

[159] Schaefer, *The Need for Federal Preemption*, *supra* note 22, at 263. The author further argues that state tort "suits by SFPs against commercial space companies should be barred by the federal government except in cases of willful misconduct, or alternatively, the lower standard of gross negligence." *Id.* at 229; *see also* Justin Silver, Note, *Houston, We Have a (Liability) Problem*, 112 Mich. L. Rev. 833, 856 (2014).

foreign competitors" understates the maturity of the U.S. industry and overstates the financial risk of assigning liability to SFPs for their own negligence.[160] The industry is quite mature by a number of criteria, including decades of cutting-edge expertise, market growth in the hundreds of billions of dollars, substantial financial protection provided by the federal indemnification regime, and government contracts that provide stable demand for services.[161] Even if the industry did have to pay out claims to high-net worth passengers, it is unlikely that the risk cited, "several hundred million dollars,"[162] would be the determining factor for whether or not a company survives financially after a major accident. The Act already requires that operators hold up to $600 million in insurance to cover claims for third-party and government losses.[163] An operator's total financial assets at stake could run in the billions of dollars. Without a much more detailed accounting of the total assets and liabilities involved in a typical launch, there is little to no evidence to support the claim that the cost of covering liability for SFPs would doom the industry financially.[164] The House Committee on Science, Space, and Technology did not even hold hearings on the Act's SFP liability cross-waiver provisions.[165]

Federal preemption as currently proposed is also practically unworkable, since there is no general federal tort law for courts to apply in place of state law. Theoretically, Congress could preempt the states by creating a more stringent liability regime—adopting a higher standard of care modeled on common carrier

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[160] Schaefer, *The Need for Federal Preemption*, *supra* note 22, at 273; Silver, *supra* note 159, at 857.

[161] *See, e.g.*, 161 CONG. REC. H3511, 3514–15 (daily ed. May 21, 2015) (statements of Rep. Pelosi and Rep. Johnson); Shane Chaddha, *U.S. Commercial Space Sector: Matured and Successful*, 36 J. SPACE L. 19, 19–20, 30–31, 51 (2010).

[162] *Schaefer*, *The Need for Federal Preemption*, *supra* note 22, at 262. No citation is provided to support an estimated burden of this magnitude.

[163] 51 U.S.C. § 50914(a)(3)(A) (2012).

[164] One proposal for federal preemption asserts that "the potential burden of tort costs is proportionally larger" for the commercial space industry than it was for railroads and airlines. Silver, *supra* note 159, at 838. The study provided via footnote does not substantiate this claim, merely indicating that the number of tort suits against British railroads rose as the number of passenger rose in the mid-1800s. *See id.* at 838 n.31. It stops short of demonstrating that the increase in lawsuits left the railroad industry with unbearable financial liabilities or that the total liability burden would be greater for space operators. No evidence is provided about the relatively liability burden of operators vis-à-vis airlines. *See id.*

[165] 161 CONG. REC. H3511, 3515 (daily ed. May 21, 2015) (statement of Rep. Johnson).

or reasonably prudent operator duties. However, Congress would have to create a source of federal law to govern potential negligence cases, which it has shown no interest in doing.[166] Preemption could resolve the current patchwork of federal and state regulations by creating more uniformity in the law, but absent any evidence of political will to ratchet up legal protections, preemption proposals fail to address the serious liability gaps for SFPs. Operators should be held financially responsible for their negligence, not passengers. A stronger state negligence approach may be more expensive for the industry in the case of a catastrophic accident, but as Representative Johnson explained during debates over the Act, "[t]here won't be any passengers when they find out that they have no protection."[167] Congress should reform the Act to facilitate greater protection for SFPs under state negligence doctrines, not less.

V. CONCLUSION

The current liability regime governing SFP safety is not sustainable in the long run. Shifting almost all the financial risks of an accident to the SFP leaves passengers to bear the cost of the industry's development. Setting aside any moral consideration about whether this distribution of risk is fair and equitable, it raises serious practical concerns for an industry that requires public support to survive. Congress should remove the SFP–operator cross-waiver mandate as a condition of operator launch licenses as soon as possible. This would give states more flexibility to apply the negligence regimes that are well developed for other forms of transportation to the commercial space industry. To avoid the potential for intractable litigation over conflicting federal and state liability regimes, Congress should amend the Act before the first SFPs travel to space. If the bureaucratic realities of the legislative process make changes in the short term infeasible, Congress should let the SFP-related liability requirements expire in 2025. The commercial space industry's rapid developments however make it likely that the first private passengers will travel to space well before 2025. If Congress fails to reform the liability regime before the first SFPs travel to space, the industry and its passengers must hope they beat the odds that a fatal accident will not occur during this period of regulatory uncertainty.

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[166] *See id.* at 3520 (statement of Rep. Edwards).

[167] *Id.* at 3515 (statement of Rep. Johnson).